



## SEQUENCE LISTING

<110> FOWLKES, Dana M.  
BROACH, Jim  
MANFREDI, John  
KLEIN, Christine  
MURPHY, Andrew J.  
PAUL, Jeremy  
TRUEHEART, Joshua

<120> YEAST CELLS ENGINEERED TO PRODUCE PHEROMONE SYSTEM PROTEIN SURROGATES AND  
USES THEREFOR

<130> CPI-012CP4DV

<140> 09/258600  
<141> 1999-02-26

<150> 08/461598  
<151> 1995-06-05

<150> 08/322137  
<151> 1994-10-13

<150> 08/309313  
<151> 1994-09-20

<150> 08/190328  
<151> 1994-01-31

<150> 08/041431  
<151> 1993-03-31

<160> 126

<170> FastSEQ for Windows Version 4.0

<210> 1  
<211> 89  
<212> PPT  
<213> *Saccharomyces cerevisiae*

<400> 1  
Met Arg Phe Pro Ser Ile Phe Thr Ala Val Leu Phe Ala Ala Ser Ser  
1 5 10 15  
Ala Leu Ala Ala Pro Val Asn Thr Thr Thr Glu Asp Glu Thr Ala Gln  
20 25 30  
Ile Pro Ala Glu Ala Val Ile Gly Tyr Leu Asp Leu Glu Gly Asp Phe  
35 40 45  
Asp Val Ala Val Leu Pro Phe Ser Asn Ser Thr Asn Asn Gly Leu Leu  
50 55 60  
Phe Ile Asn Thr Thr Ile Ala Ser Ile Ala Ala Lys Glu Glu Gly Val  
65 70 75 80  
Ser Leu Asp Lys Arg Glu Ala Glu Ala  
85

<210> 2  
<211> 76  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 2  
Trp His Trp Leu Gln Leu Lys Pro Gly Gln Pro Met Tyr Lys Arg Glu  
1 5 10 15  
Ala Glu Ala Glu Ala Trp His Trp Leu Gln Leu Lys Pro Gly Gln Pro  
20 25 30  
Met Tyr Lys Arg Glu Ala Asp Ala Glu Ala Trp His Trp Leu Gln Leu  
35 40 45  
Lys Pro Gly Gln Pro Met Tyr Lys Arg Glu Ala Asp Ala Glu Ala Trp  
50 55 60  
His Trp Leu Gln Leu Lys Pro Gly Gln Pro Met Tyr  
65 70 75

<210> 3  
<211> 15  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> FRAGMENT

<400> 3  
aagcttaaaa gaatg 15

<210> 4  
<211> 37  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<220>  
<221> CDS  
<222> (1)...(24)

<400> 4  
aaa gaa gaa ggg gta tct ttg ctt aagctcgaga tct 37  
Lys Glu Glu Gly Val Ser Leu Leu  
1 5

<210> 5  
<211> 8  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 5  
Lys Glu Glu Gly Val Ser Leu Leu  
1 5

<210> 6  
<211> 77  
<212> DNA  
<213> Artificial Sequence

&lt;220&gt;

&lt;223&gt; FRAGMENT

&lt;220&gt;

&lt;221&gt; misc\_feature

<222> 29, 30, 32, 33, 35, 36, 38, 39, 41, 42, 44, 45, 47, 48, 50,  
51, 53, 54, 56, 57, 59, 60, 62, 63, 65, 66

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 6

cgtgaagctt aagcgtgagg cagaagctnn knnknnknnk nnknnknnkn nknnknnknn 60  
knnknnktga tcattccg 77

&lt;210&gt; 7

&lt;211&gt; 19

&lt;212&gt; PRT

&lt;213&gt; Saccharomyces cerevisiae

&lt;220&gt;

&lt;221&gt; VARIANT

&lt;222&gt; 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19

&lt;223&gt; Xaa = Any Amino Acid

&lt;400&gt; 7

Lys Arg Glu Ala Glu Ala Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa  
1 5 10 15  
Xaa Xaa Xaa

&lt;210&gt; 8

&lt;211&gt; 36

&lt;212&gt; PRT

&lt;213&gt; Saccharomyces cerevisiae

&lt;400&gt; 8

Met Gln Pro Ser Thr Ala Thr Ala Ala Pro Lys Glu Lys Thr Ser Ser  
1 5 10 15  
Glu Lys Lys Asp Asn Tyr Ile Ile Lys Gly Val Phe Trp Asp Pro Ala  
20 25 30  
Cys Val Ile Ala  
35

&lt;210&gt; 9

&lt;211&gt; 19

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; FRAGMENT

&lt;400&gt; 9

aagcttttcga atagaaatg 19

&lt;210&gt; 10

&lt;211&gt; 36

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)...(27)

&lt;223&gt; FRAGMENT

&lt;400&gt; 10

gcc gct cca aaa gaa aag acc tcg agc tcgcttaag 36

Ala Ala Pro Lys Glu Lys Thr Ser Ser

1

5

&lt;210&gt; 11

&lt;211&gt; 9

&lt;212&gt; PRT

<213> *Saccharomyces cerevisiae*

&lt;400&gt; 11

Ala Ala Pro Lys Glu Lys Thr Ser Ser

1

5

&lt;210&gt; 12

&lt;211&gt; 79

&lt;212&gt; DNA

<213> *Saccharomyces cerevisiae*

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; 27, 28, 30, 31, 33, 34, 36, 37, 39, 40, 42, 43, 45, 46, 48,

49, 51, 52, 54, 55, 57, 58

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 12

ggtactcgag tgaaaagaag gacaacnnkn nknnknnknn knnknnknnk nnknnknnkt 60

gtgttattgc ttaagtacg 79

&lt;210&gt; 13

&lt;211&gt; 22

&lt;212&gt; PRT

<213> *Saccharomyces cerevisiae*

&lt;220&gt;

&lt;221&gt; VARIANT

&lt;222&gt; 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18

&lt;223&gt; Xaa = Any Amino Acid

&lt;400&gt; 13

Ser Ser Glu Lys Lys Asp Asn Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa

1

5

10

15

Xaa Xaa Cys Val Ile Ala

20

&lt;210&gt; 14

&lt;211&gt; 34

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> FRAGMENT

<400> 14

gttaagaacc atatactagt atcaaaaatg tctg

34

<210> 15

<211> 35

<212> DNA

<213> Artificial Sequence

<220>

<223> FRAGMENT

<400> 15

tgatcaaaat ttactagttt gaaaaagtaa tttcg

35

<210> 16

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> FRAGMENT

<400> 16

ggcaaaatac tagtaaaatt ttcatgtc

28

<210> 17

<211> 34

<212> DNA

<213> Artificial Sequence

<220>

<223> FRAGMENT

<400> 17

ggcccttaac aactagtgt cgcattatat ttac

34

<210> 18

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> FRAGMENT

<400> 18

ctaaagaaga aggggtatct ttgcttaagc tcgagatctc gactgataac aacagtgtag 60

<210> 19

<211> 31

<212> DNA

<213> Artificial Sequence

<220>

<223> FRAGMENT

<400> 19

catacacaat ataaagcttt aaaagaatga g

31

<210> 20  
 <211> 25  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> FRAGMENT

<400> 20  
 gctacttaag cgtgaggcag aagct 25

<210> 21  
 <211> 10  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> FRAGMENT

<400> 21  
 cggatgatca 10

<210> 22  
 <211> 41  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> FRAGMENT

<400> 22  
 ccaaaataag tacaaagctt tcgaatagaa atgcaaccat c 41

<210> 23  
 <211> 59  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> FRAGMENT

<400> 23  
 gccgctccaa aagaaaagac ctcgagctcg cttaagttct gcgtacaaaa acgttggttc 59

<210> 24  
 <211> 26  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> FRAGMENT

<400> 24  
 ggtactcgag tgaaaagaag gacaac 26

<210> 25  
 <211> 20  
 <212> DNA  
 <213> Saccharomyces cerevisiae

<400> 25

cgtacttaag caataacaca

20

<210> 26

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> FRAGMENT

<400> 26

cgtgaagctt aagcgtgagg cagaagct

28

<210> 27

<211> 57

<212> DNA

<213> Saccharomyces cerevisiae

<220>

<221> misc\_feature

<222> 12, 13, 15, 16, 18, 19, 21, 22, 24, 25, 27, 28, 30, 31, 33, 34, 36, 37, 39, 40, 42, 43, 45, 46, 48, 49

<223> n = A,T,C or G

<400> 27

cggatgatca mnnnnnnnnnnm nnnnnnnnnnnm nnnnnnnnnnnm mnnnnnnnnna gcttctg

57

<210> 28

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<223> FRAGMENT

<400> 28

ggtactcgag tgaaaagaag gacaac

26

<210> 29

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> FRAGMENT

<220>

<221> misc\_feature

<222> 22, 23, 25, 26, 28, 29, 31, 32, 34, 35, 37, 38, 40, 41, 43, 44, 46, 47, 49, 50, 52, 53

<223> n = A,T,C or G

<400> 29

cgtacttaag caataacaca mnnnnnnnnnnm nnnnnnnnnnnm nnnnnnnnnnnm mnnngttgtcc 60

<210> 30

<211> 34

<212> DNA

<213> Artificial Sequence

&lt;220&gt;

&lt;223&gt; FRAGMENT

&lt;400&gt; 30

gggaagctta tgccgagatc gtgctgccag ccgc

34

&lt;210&gt; 31

&lt;211&gt; 32

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; FRAGMENT

&lt;400&gt; 31

ggggaagact tctgccctgc gccgctgctg cc

32

&lt;210&gt; 32

&lt;211&gt; 36

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; FRAGMENT

&lt;400&gt; 32

ggggaagacc cgcaggaggc agaagcttgg ttgcag

36

&lt;210&gt; 33

&lt;211&gt; 27

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; FRAGMENT

&lt;400&gt; 33

gggagatctt cagtacattg gttggcc

27

&lt;210&gt; 34

&lt;211&gt; 32

&lt;212&gt; PRT

&lt;213&gt; Saccharomyces cerevisiae

&lt;400&gt; 34

Arg Asn Ser Ser Ser Ser Gly Ser Ser Gly Ala Gly Gln Lys Arg Glu

1

5

10

15

Ala Glu Ala Trp His Trp Leu Gln Leu Lys Pro Gly Gln Pro Met Tyr

20

25

30

&lt;210&gt; 35

&lt;211&gt; 29

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; FRAGMENT

&lt;400&gt; 35

ccgcgtctca catgccaag aagaagccg

29

<210> 36

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> FRAGMENT

<400> 36

ccgtctagat gctggcagcg tggg

24

<210> 37

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> FRAGMENT

<400> 37

ttaagcgtga ggcagaagct tatcgata

28

<210> 38

<211> 28

<212> DNA

<213> *Saccharomyces cerevisiae*

<400> 38

cgcactccgt ctgcgaatag ctatctag

28

<210> 39

<211> 71

<212> DNA

<213> *Saccharomyces cerevisiae*

<220>

<221> misc\_feature

<222> 19, 20, 22, 23, 25, 26, 28, 29, 31, 32, 34, 35, 37, 38, 40,  
41, 43, 44, 46, 47, 49, 50, 52, 53

<223> n = A,T,C or G

<400> 39

ctggatgcga agacagctnn knnknnknkn nnknnknkn nknnknknkn knnktgatca 60  
gtctgtgacg c 71

<210> 40

<211> 17

<212> DNA

<213> *Saccharomyces cerevisiae*

<400> 40

gcgtcacaga ctgatca

17

<210> 41

<211> 56

<212> DNA

<213> *Saccharomyces cerevisiae*

<400> 41  
gccgtcagta aagcttggca ttggttgcag cctatgtact gatcagtctg tgacgc 56

<210> 42  
<211> 39  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<220>  
<221> CDS  
<222> (1)...(39)

<400> 42  
tgg cat tgg ttg cag cta aaa cct ggc caa cca atg tac 39  
Trp His Trp Leu Gln Leu Lys Pro Gly Gln Pro Met Tyr  
1 5 10

<210> 43  
<211> 13  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 43  
Trp His Trp Leu Gln Leu Lys Pro Gly Gln Pro Met Tyr  
1 5 10

<210> 44  
<211> 20  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<400> 44  
ctggatgcga agactcagct 20

<210> 45  
<211> 69  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<400> 45  
cggatgatca gtacattggt tggccagggt ttagctgcaa ccaatgccaa gctgagtctt 60  
cgcatccag 69

<210> 46  
<211> 39  
<212> DNA  
<213> Artificial Sequence

<220>  
<221> CDS  
<222> (1)...(39)  
<223> FRAGMENT

<400> 46  
tgg cat tgg cta cag cta acg cct ggg caa cca atg tac 39  
Trp His Trp Leu Gln Leu Thr Pro Gly Gln Pro Met Tyr  
1 5 10

<210> 47  
<211> 13  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 47  
Trp His Trp Leu Gln Leu Thr Pro Gly Gln Pro Met Tyr  
1 5 10

<210> 48  
<211> 39  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<220>  
<221> CDS  
<222> (1)...(39)

<400> 48  
tgg cat tgg ctg gag ctt atg cct ggc caa cca tta tac 39  
Trp His Trp Leu Glu Leu Met Pro Gly Gln Pro Leu Tyr  
1 5 10

<210> 49  
<211> 13  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 49  
Trp His Trp Leu Glu Leu Met Pro Gly Gln Pro Leu Tyr  
1 5 10

<210> 50  
<211> 39  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<220>  
<221> CDS  
<222> (1)...(39)

<400> 50  
tgg cat tgg atg gag cta aga cct ggc caa cca atg tac 39  
Trp His Trp Met Glu Leu Arg Pro Gly Gln Pro Met Tyr  
1 5 10

<210> 51  
<211> 13  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 51  
Trp His Trp Met Glu Leu Arg Pro Gly Gln Pro Met Tyr  
1 5 10

<210> 52  
<211> 33  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<220>  
<221> CDS  
<222> (1)...(33)

<400> 52  
tat gct ctg ttt gtt cat ttt ttt gat att ccg  
Tyr Ala Leu Phe Val His Phe Phe Asp Ile Pro  
1 5 10

33

<210> 53  
<211> 11  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 53  
Tyr Ala Leu Phe Val His Phe Phe Asp Ile Pro  
1 5 10

<210> 54  
<211> 33  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<220>  
<221> CDS  
<222> (1)...(33)

<400> 54  
ttt aag ggt cag gtg cgt ttt gtg gtt ctt gct  
Phe Lys Gly Gln Val Arg Phe Val Val Leu Ala  
1 5 10

33

<210> 55  
<211> 11  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 55  
Phe Lys Gly Gln Val Arg Phe Val Val Leu Ala  
1 5 10

<210> 56  
<211> 33  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<220>  
<221> CDS

<222> (1)...(33)

<400> 56

ctt atg tct ccg tct ttt ttt ttt ttg cct gcg  
Leu Met Ser Pro Ser Phe Phe Phe Leu Pro Ala  
1 5 10

33

<210> 57

<211> 11

<212> PRT

<213> *Saccharomyces cerevisiae*

<400> 57

Leu Met Ser Pro Ser Phe Phe Phe Leu Pro Ala  
1 5 10

<210> 58

<211> 27

<212> DNA

<213> *Saccharomyces cerevisiae*

<400> 58

cgggatccga tgcaattttc aacatgc

27

<210> 59

<211> 23

<212> DNA

<213> *Saccharomyces cerevisiae*

<400> 59

gctctagatg ctactgatcc cgc

23

<210> 60

<211> 18

<212> DNA

<213> *Saccharomyces cerevisiae*

<400> 60

cgccgcatga ctccattg

18

<210> 61

<211> 26

<212> DNA

<213> *Saccharomyces cerevisiae*

<400> 61

ggggtaccaa taggttcttt cttagg

26

<210> 62

<211> 35

<212> DNA

<213> *Saccharomyces cerevisiae*

<400> 62

ggtgggaggg tgctctctag aaggaagtgt tcacc

35

<210> 63

<211> 41

<212> DNA

<213> *Saccharomyces cerevisiae*

<400> 63

gcccaggaga ccagaccatg gactccttca attataccac c

41

<210> 64

<211> 42

<212> DNA

<213> *Saccharomyces cerevisiae*

<400> 64

ccccttaagc gtgaggcaga agctactctg caaaagaaga tc

42

<210> 65

<211> 29

<212> DNA

<213> *Saccharomyces cerevisiae*

<400> 65

gaagatcttc agcgccgag ttgcatgtc

29

<210> 66

<211> 38

<212> DNA

<213> *Saccharomyces cerevisiae*

<400> 66

gatatatataa ggtaggaaac catgggggtgt acagtgag

38

<210> 67

<211> 34

<212> DNA

<213> *Saccharomyces cerevisiae*

<400> 67

cgagcgctcg agggaacgta taattaaagt agtg

34

<210> 68

<211> 34

<212> DNA

<213> *Saccharomyces cerevisiae*

<400> 68  
gcgcggtacc aagcttcaat tcgagataat accc

34

<210> 69  
<211> 24  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<400> 69  
cccgaatcca ccaatttctt tacg

24

<210> 70  
<211> 27  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<400> 70  
gcggcgtcga cgcggccgcg taacagt

27

<210> 71  
<211> 37  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> FRAGMENT

<400> 71  
ctgctggagc tccgctgct gctgctgggt gctggag

37

<210> 72  
<211> 43  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<400> 72  
ctgctggtcg acgcggccgc gggggttcct tcttagaagc agc

43

<210> 73  
<211> 30  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<400> 73  
gggctcgagc cttcttagag cagctcgtag

30

<210> 74  
<211> 37  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<400> 74  
ctgctggagc tcaagttgct gctggtgggt gctgggg 37

<210> 75  
<211> 44  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<400> 75  
ctgctggtcg acgcggccgc gcccctcaga agaggccgcg gtcc 44

<210> 76  
<211> 29  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<400> 76  
gggctcgagc ctcagaagag gccgcagtc 29

<210> 77  
<211> 37  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<400> 77  
ctgctggagc tcaagctgct gctactcggt gctggag 37

<210> 78  
<211> 49  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<400> 78  
ctgctggtcg acgcggccgc cactaacatc catgcttctc aataaagtc 49

<210> 79  
<211> 31  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<400> 79  
gggctcgagc atgcttctca ataaagtcca c 31

<210> 80  
<211> 19  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<400> 80  
gcattccatca ataattccag

19

<210> 81  
<211> 23  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<400> 81  
gaaacaatgg atccacttct tac

23

<210> 82  
<211> 66  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 82  
Met Gly Cys Thr Val Ser Thr Gln Thr Ile Gly Asp Glu Ser Asp Pro  
1 5 10 15  
Phe Leu Gln Asn Lys Arg Ala Asn Asp Val Ile Glu Gln Ser Leu Gln  
20 25 30  
Leu Glu Lys Gln Arg Asp Lys Asn Glu Ile Lys Leu Leu Leu Leu Gly  
35 40 45  
Ala Gly Glu Ser Gly Lys Ser Thr Val Leu Lys Gln Leu Lys Leu Leu  
50 55 60  
His Gln  
65

<210> 83  
<211> 65  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 83  
Met Gly Cys Leu Gly Thr Ser Lys Thr Glu Asp Gln Arg Asn Glu Glu  
1 5 10 15  
Lys Ala Gln Arg Glu Ala Asn Lys Lys Ile Glu Lys Gln Leu Gln Lys  
20 25 30  
Asp Lys Gln Val Tyr Arg Ala Thr His Arg Leu Leu Leu Leu Gly Ala  
35 40 45  
Gly Glu Ser Gly Lys Ser Thr Ile Val Lys Gln Met Arg Ile Leu His  
50 55 60  
Val  
65

<210> 84  
<211> 58  
<212> PRT  
<213> *Saccharomyces cerevisiae*

&lt;400&gt; 84

Met Gly Cys Thr Val Ser Ala Glu Asp Lys Ala Ala Ala Glu Arg Ser  
1 5 10 15  
Lys Met Ile Asp Lys Asn Leu Arg Glu Asp Gly Glu Lys Ala Ala Arg  
20 25 30  
Glu Val Lys Leu Leu Leu Leu Gly Ala Gly Glu Ser Gly Lys Ser Thr  
35 40 45  
Ile Val Lys Gln Met Lys Ile Ile His Glu  
50 55

&lt;210&gt; 85

&lt;211&gt; 58

&lt;212&gt; PRT

<213> *Saccharomyces cerevisiae*

&lt;400&gt; 85

Met Gly Cys Thr Val Ser Ala Glu Asp Lys Ala Ala Val Glu Arg Ser  
1 5 10 15  
Lys Met Ile Asp Arg Asn Leu Arg Glu Asp Gly Glu Lys Ala Ala Lys  
20 25 30  
Glu Val Lys Leu Leu Leu Leu Gly Ala Gly Glu Ser Gly Lys Ser Thr  
35 40 45  
Ile Val Lys Gln Met Lys Ile Ile His Glu  
50 55

&lt;210&gt; 86

&lt;211&gt; 67

&lt;212&gt; PRT

<213> *Saccharomyces cerevisiae*

&lt;400&gt; 86

Met Ala Arg Ser Leu Thr Trp Arg Cys Cys Pro Trp Cys Leu Thr Glu  
1 5 10 15  
Asp Glu Lys Ala Ala Ala Arg Val Asp Gln Glu Ile Asn Arg Ile Leu  
20 25 30  
Leu Glu Gln Lys Lys Gln Asp Arg Gly Glu Leu Lys Leu Leu Leu Leu  
35 40 45  
Gly Pro Gly Glu Ser Gly Lys Ser Thr Phe Ile Lys Gln Met Arg Ile  
50 55 60  
Ile His Gly  
65

&lt;210&gt; 87

&lt;211&gt; 66

&lt;212&gt; PRT

<213> *Saccharomyces cerevisiae*

&lt;400&gt; 87

Met	Gly	Cys	Thr	Val	Ser	Thr	Gln	Thr	Ile	Gly	Asp	Glu	Ser	Asp	Pro
1				5					10					15	
Phe	Leu	Gln	Asn	Lys	Arg	Ala	Asn	Asp	Val	Ile	Glu	Gln	Ser	Leu	Gln
			20					25					30		
Leu	Glu	Lys	Gln	Arg	Asp	Lys	Asn	Glu	Arg	Lys	Leu	Leu	Leu	Leu	Gly
		35					40					45			
Ala	Gly	Glu	Ser	Gly	Lys	Ser	Thr	Ile	Val	Lys	Gln	Met	Arg	Ile	Leu
	50					55					60				
His	Val														
65															

&lt;210&gt; 88

&lt;211&gt; 66

&lt;212&gt; PRT

<213> *Saccharomyces cerevisiae*

&lt;400&gt; 88

Met	Gly	Cys	Thr	Val	Ser	Thr	Gln	Thr	Ile	Gly	Asp	Glu	Ser	Asp	Pro
1				5					10					15	
Phe	Leu	Gln	Asn	Lys	Arg	Ala	Asn	Asp	Val	Ile	Glu	Gln	Ser	Leu	Gln
			20					25					30		
Leu	Glu	Lys	Gln	Arg	Asp	Lys	Asn	Glu	Val	Lys	Leu	Leu	Leu	Leu	Gly
		35					40					45			
Ala	Gly	Glu	Ser	Gly	Lys	Ser	Thr	Ile	Val	Lys	Gln	Met	Lys	Ile	Ile
	50					55					60				
His	Glu														
65															

&lt;210&gt; 89

&lt;211&gt; 66

&lt;212&gt; PRT

<213> *Saccharomyces cerevisiae*

&lt;400&gt; 89

Met	Gly	Cys	Thr	Val	Ser	Thr	Gln	Thr	Ile	Gly	Asp	Glu	Ser	Asp	Pro
1				5					10					15	
Phe	Leu	Gln	Asn	Lys	Arg	Ala	Asn	Asp	Val	Ile	Glu	Gln	Ser	Leu	Gln
			20					25					30		
Leu	Glu	Lys	Gln	Arg	Asp	Lys	Asn	Glu	Val	Lys	Leu	Leu	Leu	Leu	Gly
		35					40					45			
Ala	Gly	Glu	Ser	Gly	Lys	Ser	Thr	Ile	Val	Lys	Gln	Met	Lys	Ile	Ile
	50					55					60				
His	Glu														
65															

&lt;210&gt; 90

&lt;211&gt; 66

&lt;212&gt; PRT

<213> *Saccharomyces cerevisiae*

&lt;400&gt; 90

Met Gly Cys Thr Val Ser Thr Gln Thr Ile Gly Asp Glu Ser Asp Pro  
1 5 10 15  
Phe Leu Gln Asn Lys Arg Ala Asn Asp Val Ile Glu Gln Ser Leu Gln  
20 25 30  
Leu Glu Lys Gln Arg Asp Lys Asn Glu Leu Lys Leu Leu Leu Leu Gly  
35 40 45  
Pro Gly Glu Ser Gly Lys Ser Thr Phe Ile Lys Gln Met Arg Ile Ile  
50 55 60  
His Gly  
65

<210> 91  
<211> 39  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<221> CDS  
<222> (1)...(39)

<400> 91  
tgg cat tgg ttg cag cta aaa cct ggc cag cct atg tac 39  
Trp His Trp Leu Gln Leu Lys Pro Gly Gln Pro Met Tyr  
1 5 10

<210> 92  
<211> 13  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 92  
Trp His Trp Leu Gln Leu Lys Pro Gly Gln Pro Met Tyr  
1 5 10

<210> 93  
<211> 39  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<221> CDS  
<222> (1)...(39)

<400> 93  
tgg cat tgg ttg tcc ttg tgg ccc ggc cag cct atg tac 39  
Trp His Trp Leu Ser Leu Ser Pro Gly Gln Pro Met Tyr  
1 5 10

<210> 94  
<211> 13  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 94  
Trp His Trp Leu Ser Leu Ser Pro Gly Gln Pro Met Tyr

1

5

10

<210> 95  
<211> 39  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<221> CDS  
<222> (1)...(39)

<400> 95  
tgg cat tgg ttg tcc ctg gac gct ggc cag cct atg tac 39  
Trp His Trp Leu Ser Leu Asp Ala Gly Gln Pro Met Tyr  
1 5 10

<210> 96  
<211> 13  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 96  
Trp His Trp Leu Ser Leu Asp Ala Gly Gln Pro Met Tyr  
1 5 10

<210> 97  
<211> 39  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<221> CDS  
<222> (1)...(39)

<400> 97  
tgg cat tgg ttg acc ttg atg gcc ggg cag cct atg tac 39  
Trp His Trp Leu Thr Leu Met Ala Gly Gln Pro Met Tyr  
1 5 10

<210> 98  
<211> 13  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 98  
Trp His Trp Leu Thr Leu Met Ala Gly Gln Pro Met Tyr  
1 5 10

<210> 99  
<211> 39  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<221> CDS  
<222> (1)...(39)

<400> 99  
tgg cat tgg ttg cag ctg tgg gcg ggc cag cct atg tac 39  
Trp His Trp Leu Gln Leu Ser Ala Gly Gln Pro Met Tyr  
1 5 10

<210> 100  
<211> 13  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 100  
Trp His Trp Leu Gln Leu Ser Ala Gly Gln Pro Met Tyr  
1 5 10

<210> 101  
<211> 39  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<221> CDS  
<222> (1)...(39)

<400> 101  
tgg cat tgg ttg agg ttg cag tcc ggc cag cct atg tac 39  
Trp His Trp Leu Arg Leu Gln Ser Gly Gln Pro Met Tyr  
1 5 10

<210> 102  
<211> 13  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 102  
Trp His Trp Leu Arg Leu Gln Ser Gly Gln Pro Met Tyr  
1 5 10

<210> 103  
<211> 39  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<221> CDS  
<222> (1)...(39)

<400> 103  
tgg cat tgg ttg cgc ttg tcc gcc ggc cag cct atg tac 39  
Trp His Trp Leu Arg Leu Ser Ala Gly Gln Pro Met Tyr  
1 5 10

<210> 104  
<211> 13  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 104  
Trp His Trp Leu Arg Leu Ser Ala Gly Gln Pro Met Tyr  
1 5 10

<210> 105  
<211> 39  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<221> CDS  
<222> (1)...(39)

<400> 105  
tgg cat tgg ttg tgg ctc gtc ccg ggg cag cct atg tac 39  
Trp His Trp Leu Ser Leu Val Pro Gly Gln Pro Met Tyr  
1 5 10

<210> 106  
<211> 13  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 106  
Trp His Trp Leu Ser Leu Val Pro Gly Gln Pro Met Tyr  
1 5 10

<210> 107  
<211> 39  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<221> CDS  
<222> (1)...(39)

<400> 107  
tgg cat tgg ttg tcc ctg tac ccc ggg cag cct atg tac 39  
Trp His Trp Leu Ser Leu Tyr Pro Gly Gln Pro Met Tyr  
1 5 10

<210> 108  
<211> 13  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 108  
Trp His Trp Leu Ser Leu Tyr Pro Gly Gln Pro Met Tyr  
1 5 10

<210> 109  
<211> 39  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<221> CDS  
<222> (1)...(39)

<400> 109  
tgg cat tgg ttg cgg ctg cag ccc ggg cag cct atg tac 39  
Trp His Trp Leu Arg Leu Gln Pro Gly Gln Pro Met Tyr  
1 5 10

<210> 110  
<211> 13  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 110  
Trp His Trp Leu Arg Leu Gln Pro Gly Gln Pro Met Tyr  
1 5 10

<210> 111  
<211> 62  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 111  
Arg Ile Asp Thr Thr Gly Ile Thr Glu Thr Glu Phe Asn Ile Gly Ser  
1 5 10 15  
Ser Lys Phe Lys Val Leu Asp Ala Gly Gly Gln Arg Ser Glu Arg Lys  
20 25 30  
Lys Trp Ile His Cys Phe Glu Gly Ile Thr Ala Val Leu Phe Val Leu  
35 40 45  
Ala Met Ser Glu Tyr Asp Gln Met Leu Phe Glu Asp Glu Arg  
50 55 60

<210> 112  
<211> 62  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 112  
Arg Val Leu Thr Ser Gly Ile Phe Glu Thr Lys Phe Gln Asn Asp Lys  
1 5 10 15  
Val Asn Phe His Met Phe Asp Val Gly Gly Gln Arg Asp Glu Arg Lys  
20 25 30  
Lys Trp Ile Gln Cys Phe Asn Asp Val Thr Ala Ile Ile Phe Val Val  
35 40 45  
Ala Ser Ser Ser Tyr Asn Met Val Ile Arg Glu Asp Asn Gln

50

55

60

<210> 113  
<211> 62  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 113  
Arg Val Lys Thr Thr Gly Ile Val Glu Thr His Phe Thr Phe Lys Asp  
1 5 10 15  
Leu His Phe Lys Met Phe Asp Val Gly Gly Gln Arg Ser Glu Arg Lys  
20 25 30  
Lys Trp Ile His Cys Phe Glu Gly Val Thr Ala Ile Ile Phe Cys Val  
35 40 45  
Ala Leu Ser Ala Tyr Asp Leu Val Leu Ala Asp Glu Glu Met  
50 55 60

<210> 114  
<211> 62  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 114  
Arg Val Lys Thr Thr Gly Ile Val Glu Thr His Phe Thr Phe Lys Asp  
1 5 10 15  
Leu Tyr Phe Lys Met Phe Asp Val Gly Gly Gln Arg Ser Glu Arg Lys  
20 25 30  
Lys Trp Ile His Cys Phe Glu Gly Val Thr Ala Ile Ile Phe Cys Val  
35 40 45  
Ala Leu Ser Asp Tyr Asp Leu Val Leu Ala Glu Asp Glu Glu  
50 55 60

<210> 115  
<211> 62  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 115  
Arg Val Lys Thr Thr Gly Ile Val Glu Thr His Phe Thr Phe Lys Asn  
1 5 10 15  
Leu His Phe Arg Leu Phe Asp Val Gly Gly Gln Arg Ser Glu Arg Lys  
20 25 30  
Lys Trp Ile His Cys Phe Glu Asp Val Thr Ala Ile Ile Phe Cys Asn  
35 40 45  
Ala Leu Ser Gly Tyr Asp Gln Val Leu His Glu Asp Glu Thr  
50 55 60

<210> 116  
<211> 62  
<212> PRT  
<213> *Saccharomyces cerevisiae*

&lt;400&gt; 116

Arg	Val	Pro	Thr	Thr	Gly	Ile	Ile	Glu	Tyr	Pro	Phe	Asp	Leu	Glu	Asn
1				5				10					15		
Ile	Ile	Phe	Lys	Met	Val	Asp	Ala	Gly	Gly	Gln	Arg	Ser	Glu	Arg	Lys
			20					25					30		
Lys	Trp	Ile	His	Cys	Phe	Glu	Asn	Val	Thr	Ser	Ile	Met	Phe	Leu	Val
		35					40					45			
Ala	Leu	Ser	Glu	Tyr	Asp	Gln	Cys	Leu	Glu	Glu	Asn	Asn	Gln		
	50					55					60				

&lt;210&gt; 117

&lt;211&gt; 62

&lt;212&gt; PRT

<213> *Saccharomyces cerevisiae*

&lt;400&gt; 117

Arg	Met	Pro	Thr	Thr	Gly	Ile	Asn	Glu	Tyr	Cys	Phe	Ser	Val	Gln	Lys
1				5				10					15		
Thr	Asn	Leu	Lys	Ile	Val	Asp	Ala	Gly	Gly	Gln	Arg	Ser	Glu	Arg	Lys
			20					25					30		
Lys	Trp	Ile	His	Cys	Phe	Glu	Asn	Ile	Ile	Ala	Leu	Ile	Tyr	Leu	Ala
		35					40					45			
Ser	Leu	Ser	Glu	Tyr	Asp	Gln	Val	Leu	Val	Glu	Ser	Asp	Asn		
	50					55					60				

&lt;210&gt; 118

&lt;211&gt; 25

&lt;212&gt; DNA

<213> *Saccharomyces cerevisiae*

&lt;400&gt; 118

agcttctgccc tcacgcttaa gtagc

25

&lt;210&gt; 119

&lt;211&gt; 26

&lt;212&gt; DNA

<213> *Saccharomyces cerevisiae*

&lt;400&gt; 119

gttgccttc ttttcactcg agtacc

26

&lt;210&gt; 120

&lt;211&gt; 10

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> FRAGMENT

<400> 120

Leu Leu Leu Leu Gly Ala Gly Glu Ser Gly  
1 5 10

<210> 121

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> FRAGMENT

<400> 121

Leu Leu Leu Leu Gly Ala Gly Glu  
1 5

<210> 122

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> FRAGMENT

<400> 122

Gln Ala Arg Lys Leu Gly Ile Gln  
1 5

<210> 123

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> FRAGMENT

<400> 123

Leu Ile His Glu Asp Ile Ala Lys Ala  
1 5

<210> 124

<211> 5

<212> PRT

<213> *Saccharomyces cerevisiae*

<400> 124

Asp Val Gly Gly Gln  
1 5

<210> 125

<211> 7

<212> PRT  
<213> Artificial Sequence

<220>  
<223> FRAGMENT

<400> 125  
Ser Ser Gly Ala Gly Lys Arg  
1 5

<210> 126  
<211> 69  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> FRAGMENT

<400> 126  
gacctacgct tctgagtcga accgtaacca acgtcgattt tggaccgggt gggtacatga 60  
ctagtaggc 69